FRAGILE RELATIONSHIPS:
JAPAN, HIGH TECHNOLOGY, AND U.S. VITAL INTERESTS

BY:

Col David McCloud
National War College
Class of 1990

April 4, 1990

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
04 APR 1990		**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Fragile Relationships: Japan, High Technology, and U.S. Vital Interests	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **National War College,300 5th Avenue,Fort Lesley J. McNair,Washington,DC,20319-6000**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT
see report

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**		**33**	

CONTENTS

I. DANGEROUS TRENDS

Who won the war?

By the end of this decade the American way of life as we know it today will be lost. A deep recession will grip the country as we use increasing amounts of our wealth to service the national debt. Japan will be our creditor. U.S. market shares, both overseas and stateside, will be dramatically eroded from the already shrunken shares of 1990. Japan will own those new shares. We will have lost the lead in most high technologies including two of our most precious and enduring...fighter aircraft and supercomputers. At risk will be the commercial aviation market. Japanese basic research will become a dominant force for innovation and continued growth. No longer will they be dependent upon our ideas to fuel the engine of their economic miracle. The complex set of issues that led us down this disastrous road will also lead us to simple solutions and scapegoats. Our new-found enemy will be Japan. In fact, many Americans already see Japan as an enemy. The Washington Post (Feb. 11, 1990) noted that some public opinion polls "show that a majority of Americans now see the Japanese economic prowess as a greater threat to U.S. security than Soviet military power."

To prevent this eventuality and even the perception thereof, the United States must respond to the Japanese "economic threat" soon. Concurrently, smaller U.S. military forces must continue to provide credible deterrence while protecting national interests worldwide.

Do we have the leadership, foresight, and political will to adequately address future "threats," both economic and military, in times of intense competition for limited resources?

Situation: Bad...and getting worse

As the United States enters the decade of the 1990's, it does so with a sense of foreboding. Americans note with amazement (no longer amusement) that Japan has captured the high technology consumer marketplace with quality goods--once our signature. We see a dramatic decrease in the skills of our next generation workforce precipitated by a seriously flawed education system, escalating drug usage, and lack of motivation. Rampant overconsumption of goods and services by the government and the population has led to enormous personal and public debt undermining our fiscal well being. Business, the centerpiece of economic success, has frequently come under fire by a hostile Congress and public, especially in military procurements. Corporate expenditures on research and development (R&D) have declined dramatically (Figure 1) and, for the first time in 14

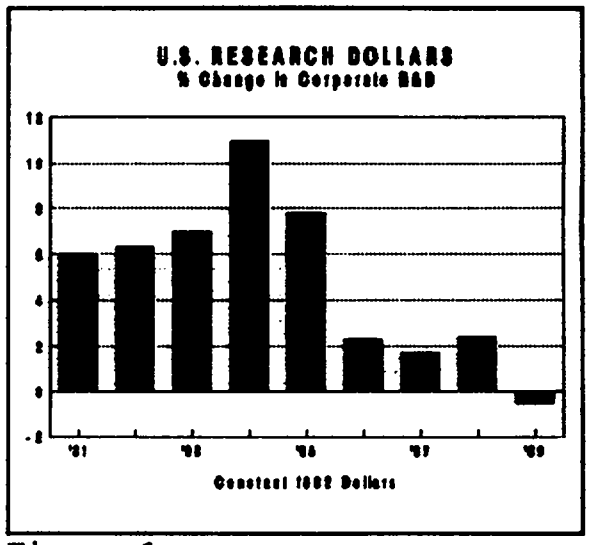

Figure 1

years, have failed to keep pace with inflation.[1] It is with great concern that we enter this decade and face the growing economic might of Japan, a nation that intends to win this "economic war."

To many Americans, our relationship with Japan is one fraught with ominous undercurrents. We hear about many problems but fail to grasp the complexity of the issues. What we see is a snap-shot look; a headline or, for the more informed, a short spot on the nightly news. Because of the complexity of the issues, electronic media has avoided in-depth analysis of the Japan-U.S. relationship. We are left with a "sense" that something is wrong, but we cannot put our finger on it. This essay will attempt to define this "sense" more clearly. To do so requires an understanding of the battlefield, the threat, the capabilities and limitations of both Japan and the U.S., and the stakes of this competition.

II. THE BATTLEFIELD

The world environment that demanded a focus on military strategies and large standing armies has dramatically changed. The new battlefield is economic competition. Few would question that "the" fundamental national interest is defense of the population. People expect the government to protect the vital interests of the country, its economic and moral well being and its democratic

---

[1] "A Corporate Lag in Research Funds is Causing Worry," The New York Times, Jan. 23, 1990, p. A-1.

institutions. The government has successfully accomplished this task for over two centuries. It has contained the Soviet threat for forty years through economic and military strength. Now the fundamental nature of superpower competition is changing, and we are not prepared. A national economic strategy may be as important as a military strategy in winning the competition...a competition centered upon technological leadership. To lose the competition is to undermine our standard of living.

High technology

What is high technology and why is it so important to our future? In general, high technology can be described as a broad grouping of technologies that are revolutionizing our way of life. Electronic devices, microelectronics, computers, robotics, advanced materials, biotechnology, superconductivity, telecommunications, and aerospace loosely define the current boundaries of high tech. These technologies are, or will be, pervasive in our lives. For better or for worse they will shape and influence our day-to-day existence. As they mature, new ideas will spawn new products and processes at an ever increasing rate. What took ten years to develop and produce in 1980 is now taking half that time. Predictions for new computer technology show remarkably shorter development times from generation to generation; three years in the late 1980's to half that time in the early 1990's.

High technology is the very foundation of our dominant power in the

world. It allowed us supremacy in both economic and military power while simultaneously rebuilding Europe and Japan after the devastation of World War II. The development and fielding of high technology systems insure that American military hardware is qualitatively superior to that of any adversary. It provides the key to a credible deterrence, both conventional and nuclear.

Equally important is the role high technology plays in the vitality of our industrial base. It allows manufactured goods to compete successfully in domestic and international markets resulting in more jobs, capital, and trade for American business. High technology allows us to raise our living standards and remain competitive in international markets.

History shows that nations able to exploit new technological innovations before others have gained both economic and military advantages.[2] We can expect to see an even more dramatic effect in the future as innovative ideas proliferate through advanced telecommunications systems. Virtually all aspects of our economy and military are affected by the revolution in high tech. The central question becomes: Who will control the high technology battlefield? The answer to this question is vital to our national

---

[2] Britain led the Industrial Revolution by exploiting industrial and transportation technologies. The empire of "Pax Britannia" dominated world trade and economics for almost two centuries. "Pax Americana" was created on the vast, advanced technology base created in WWII. It has lasted for roughly fifty years. Is "Pax Japan" just beginning? The rise of its high tech industrial base may indicate so.

interests. In fact, our competitive position in high technology may be the most vital of our interests in the long-term.

III. THE THREAT

The world appears to be evolving into large economic regions with the United States-Canada Free Trade Area, Japan, and Europe (European Community '92-EC92) dominating. Other regions including Asia's "little tigers" (i.e. South Korea, Singapore, Hong Kong and Taiwan) and India will compete but not on a level equivalent to the big three. EC92, a potential economic giant, may be impeded by contentious internal economic and political relationships. Most notably, Britain and France are concerned with German reunification and its probable political and economic dominance within the community. Enormous capital assets[3] will be required to rebuild Eastern Europe and most will be provided by Western Europe, thus further delaying their internal capitalization. Japan and the U.S. will probably not feel intense competition from Europe for years to come, especially in capital intensive high technology.

Resurgent Japan

In the last decade Japan has enjoyed phenomenal growth in its GNP. Most of its international growth has been accomplished by exploiting U.S. ideas, producing world standard consumer goods,

---

[3] Some estimates put the requirement for rebuilding East Germany alone at $100B-$600B!

aggressive marketing, and protecting indigenous markets. In key industries such as computers and semiconductors, growth in market shares has been sensational. In 1978 the United States supplied 65% of the memory-chips (semiconductors) to the world market; Japan 35%. By 1989 the figures had changed dramatically. The U.S. market share shrunk to only 12% while the Japanese grew to 80%! Other nations such as Korea, Taiwan, and Singapore now account for 8%.[4] Dominance in key strategic technologies such as semiconductors raises profound questions as to U.S vulnerabilities in times of crisis. What influence will Japan have on U.S. strategy when national interests conflict? The following question posed by Mr. Shintaro Ishihara, a member of the Japanese Diet, is more direct. "If, for example, Japan sold chips to the Soviet Union and stopped selling them to the U.S., this would upset the entire military balance."[5]

Japan has not limited its growth to the advanced high technologies already listed. Two other areas demand special attention due to their strategic implications for the United States. The first is finance, the second space. Although financial services are not

---

[4]. "U.S. Memories a Thing of the Past," USA TODAY, Jan. 15, 1990, p.2B, (Source: Semiconductor Industry Assoc. and Dataquest). Note: The numbers vary depending upon the source and "type" of semiconductor. The trends remain consistent. Some reasons for this dramatic shift include: lower production costs; better manufacturing techniques; higher quality products; excellent marketing plans; and, direct and indirect government support.

[5] Akio Morita and Shintaro Ishihara, The Japan that can say "No", Kobunsha, Kappa-Holmes, 1990, p.4.

normally viewed as either commodities for export trade or as high technology, their impact on world affairs is great.

Japan has been relentless in providing financing for the rest of the world through its banks, securities firms and insurance companies. High technology communications and information systems have enabled instant Japanese access to world financial centers. In the last ten years they have gained "unprecedented influence over how global capital resources will be allocated, at what terms, and, most of all, to whose profit."[6] The dramatic rise of Japanese dominance in global banking is underscored by the fact that in 1982 only two of Japan's banks ranked in the world's top ten; Dai-Ichi Kangyo Bank in eighth position and Fuji Bank in tenth position. By 1986 only two of the top ten were non-Japanese and only one of these was U.S. owned...Citicorp. By 1989 all of the top ten were Japanese giants dwarfing Citicorp, which had dropped to 24th. As of April 1990, the top twenty world banks were Japanese! Figures 2 and 3 (next page) show the dramatic Japanese takeover of the banking markets in a remarkably short time. It also shows a similar dramatic decline in the U.S. position.

---

[6]. Daniel Burnstein, YEN!, New York, Ballantine Books, 1990, p. 127.

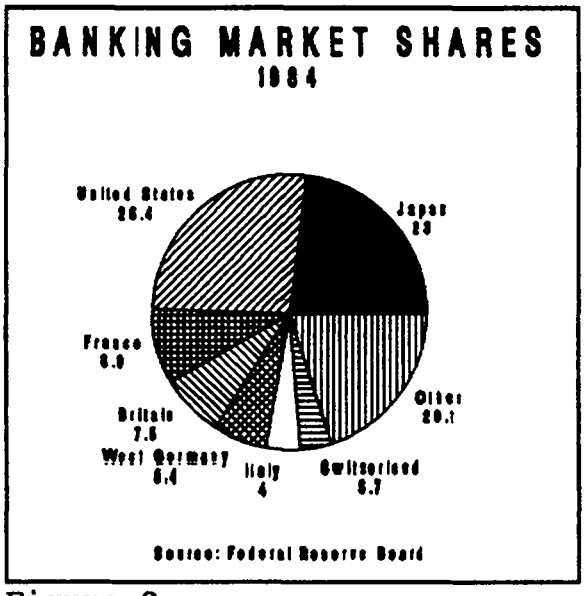

Figure 2

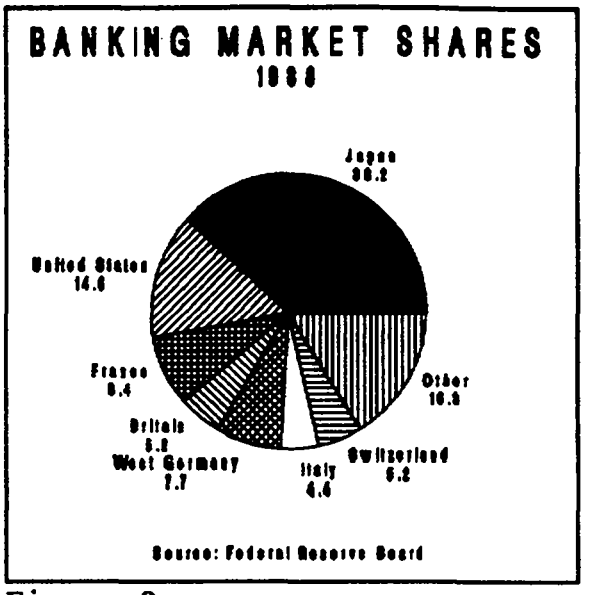

Figure 3

Japan has a bold vision for space. On Feb. 7, 1990 they launched an H-1 booster with three satellites and intend to increase the frequency of launches dramatically in the next decade. Their emphasis on the commercialization of space, as opposed to military uses, allows them the benefit of focusing national efforts. They have done this repeatedly in other high tech commercial areas with outstanding success. U.S. preeminence in both commercial and military uses of space faces a serious challenge from the Japanese. We have consistently underestimated their capabilities in areas that seemed "too hard and too complex" for them to enter successfully. Each time they captured large shares of the marketplace at our expense. Space is the next frontier and the country that successfully commercializes operations in space will hold a key strategic position. Japan's national plan supports a leadership role in space.

Japan-the "free rider"

The Japanese have made great strides in high technology but much of the progress is due to exploitation of Western research, primarily that of the United States.[7] Japan has been a "free rider in the world technology system."[8] This has enabled them to capture large market shares in many commercial areas but will inhibit them from being leaders across the spectrum of high tech. To gain leadership they will have to devote a significant portion of their vast profits into basic research which, in turn, would be commercialized by indigenous industry. Shortcomings in basic research are not lost on Japanese political or corporate leadership. Akimi Kamiya, head of Mitsubishi Electrics Customer Products Division, recently stated: "If we only imitate others we can't produce good profits. We need to be first."[9] The year 1988 represented the first year Japanese commercial research and development expenditures exceeded those of the United States.

The list of lost U.S. market shares is expanding at an alarmingly dangerous rate. While Japanese emphasis has been on commercial high tech, the focus is now shifting to a broader front that

---

[7] Bell Laboratories invented the transistor. Japan commercialized it in portable radios. In the 1970's, Xerox's Palo Alto Research Center invented the laser printer and work station. These were soon commercialized by Japanese firms...they dominate these markets now.

[8] Ferguson, Charles H. "America's High-Tech Decline," Foreign Policy, Spring 1990, p. 133.

[9]. Beauchamp, Marc. "We Need To Be First," Forbes, Feb. 5, 1990, Volume 145, Number 3, p.112.

includes military technologies. In the United States these usually represent our leading edge, highly classified technologies. While the U.S. still leads in many areas, the Japanese are showing significant progress in narrowing the gaps. One wonders what the Japanese are doing in their classified military research departments.

IV. CAPABILITIES AND LIMITATIONS

The Japanese quest

Since the end of World War II, Japan has been dependent upon the United States. Rebuilding the post-WWII Japanese economy and restoration of its political life was accomplished by U.S. leadership and financial support combined with the work ethic and skills of the Japanese people. However, the magnitude of direct financial support from the U.S. was not on the scale of the Marshall Plan for Europe. Limited U.S. aid forced the Japanese to look internally for growth capital. This inward focus, which reflected strong cultural preferences, resulted in a bold, self reliant strategy: generate capital from within through savings and trade. Although this seemed absurd to many at the time, it was logical to the Japanese...and to others, later.

Daniel Burnstein points out in his excellent book, YEN!, "By the 1930's Japan was one of the world's greatest industrial powers and a net creditor nation...Even then the West perceived a Japanese

economic conspiracy taking shape in the monopolistic structure of the huge industrial groupings known as *zaibatsus*--Mitsui, Mitsubishi, Sumitomo, and Yasuda."[10] He notes that although much of their physical plant was destroyed during WWII, the organizational structure was not. In fact, "Less than one percent of Japan's wartime business leaders were purged from their posts." It is not surprising then, that their post-war strategy reflected a continuation of pre-war pursuits.

The Japanese quest to gain superpower status has been consistent for a century...and successful. Their strengths include a homogeneous culture with strong, similar traditions including: a strong work ethic; a high literacy rate; quality educational institutions; a national plan that often uses government to help industry in research and worldwide competition; a relatively closed domestic economic environment; and a high technology industrial base that, in many areas, is the best in the world. While each characteristic plays an important role in their success as a superpower, the high technology industrial base is of fundamental importance. Its role will expand dramatically in the future.

Japan does have weaknesses--weaknesses that have dominated their strategic considerations for 150 years. As an insular nation the size of California, Japan has very limited natural resources and is

---

[10] Burnstein, Daniel. YEN!, New York, Ballantine Books, 1990, p. 112,113.

therefore dependent on foreign trade, especially in oil. She also is surrounded by historic enemies in Korea, China and the Soviet Union. Each side remembers the past, especially World War II. In fact, territory known as the "four northern islands" is still occupied by the Soviets.

Some critics say that the Japanese are not innovative and must rely on the ideas of others to be the catalyst for their industries. This "limitation," if in fact real, may be more a reflection of necessity. With sparse natural resources the Japanese used their limited capital to exploit rather than invent. Today, with seemingly unlimited capital, they are shifting the emphasis to more basic and applied research in addition to development.

As Japan continues to grow as an economic power the world press takes notice. American daily media coverage focusing on Japan-U.S. issues is reporting more "anti-Japan" feelings as reflected in recent public opinion polls. Public opinion polls in Japan show similar hostility towards the U.S. Ironically, Japan's strength may be its greatest weakness. Japan "bashing" could lead to U.S. protectionism. Already, the perception that Japan gained its wealth unfairly through exploitation of the U.S. is widespread. The result has been intense pressure by the Bush Administration to open closed Japanese domestic markets. If action is not taken to our satisfaction, protectionist measures could be taken "to punish"

the Japanese.[11] Robert Mosbacher, U.S. Secretary of Commerce, recently signed a four-part trade expansion program with Japan's International Trade and Industry Minister, Kabun Muto.[12] This represents limited progress at best. More importantly, Japan unveiled a plan late last year granting tax breaks to companies buying imported goods. The long term effects of this policy must be watched closely. Overall, progress is slow and prospects dim.

What about U.S. capabilities and weaknesses? Has it been Japanese unfairness that caused this schism to develop or have other factors been involved? As Zbigniew Brzezinski stated, "The Japanese feel victimized, the Americans feel exploited, and resentment is reciprocal...If history is any guide, there can only be three outcomes to the emerging financial dilemma: war, bankruptcy or inflation."[13] U.S. strengths and weaknesses are central to this dangerous trend.

America's decline?

Great Britain dominated the nineteenth century by achieving preeminence in world trade and financial institutions. In doing so it established a commanding position for British subjects,

---

[11] Japan was labeled an "unfair trader" in the Section 301 provision of the 1988 Omnibus Trade and Competitiveness Act.

[12] Riley, K. "U.S., Japan Agree on Expansion of Trade," The Washington Times, Mar. 15, 1990, p.C-1.

[13] Brzezinski, Zbigniew. "How About an Informal U.S.-Japan Inc.?", The New York Times, April 28, 1987.

industry, and government. The "pound sterling" was the world standard. The early 20th century decline of Britain was followed by the rise of the United States. The two world wars accelerated the process and amplified the differences between nations at the end of World War II. American institutions and industry emerged unscathed while the other industrial nations lay in ruins. Our scientific, military and economic prowess was supreme.

The Cold War directed our national wealth along two primary paths: 1.) An unprecedented military build-up dominated by nuclear weapons; and 2.) The Marshall Plan that financed rebuilding European society. Each path was expensive. The first enabled industry and science to expand its technological lead while the second transformed Europe from the ruin of war into a viable society. Each path was necessary and highly successful.

Today, we have changed, as have our primary competitors. The facade of a Soviet "Union" and its "allies" has been removed revealing internal weaknesses and economic disaster. The military might remains but it has been shown to be much more vulnerable to recent American technological achievements. Western Europe remains a staunch ally and economic competitor while Japan is now our financier and chief economic competitor. We have remained the protector of the non-communist world and have lost our economic preeminence as a result while others have grown stronger.

"If you can't beat them..."

Our strengths remain. The United States military is the most powerful in the world; its civilian institutions are still a respected model for others to emulate; America's domestic economy is the largest and most productive in the world; and its industrial base is still dominant in many key technologies. We are strategically independent in natural resources although we import some for economic reasons.[14] However, while these strengths remain, they are either eroding or are not being exploited.

Our weaknesses are growing and undermining the economic competitiveness of this country. Drugs, education, lack of domestic savings (see Fig. 4), private and government debt, deteriorating work ethic, and lack of leadership all play an important part in the decline. If the Japanese are better educated, work harder and longer, and dedicate more money to improving their competitive position, then how can we hope to compete in the future? If their strategic focus is long-term while ours is short-term then how can we adequately prepare for the

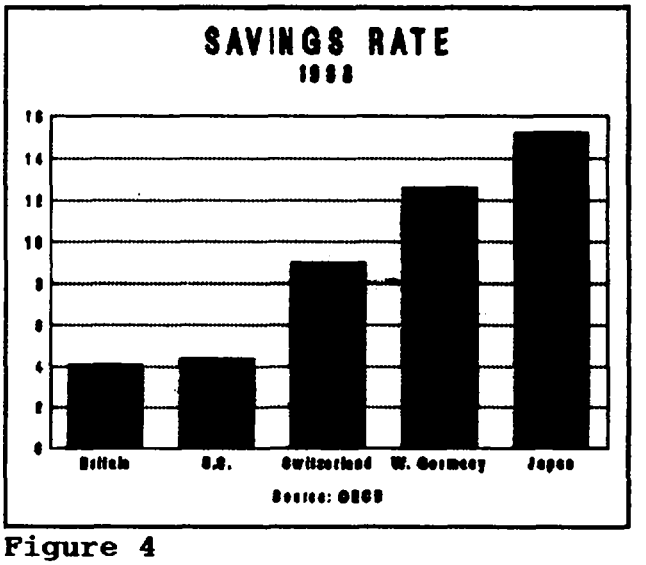

Figure 4

[14] In a crisis (e.g. a complete cut-off of oil imports), the U.S. could exploit strategic reserves and be self-sufficient...whatever the cost.

future? These weaknesses seriously degrade our capability to deal with high technology, the essence of our future.

Also detrimental to our ability to compete, especially in high technology, are archaic governmental policies and laws that have given unfair advantage to Japanese firms while stifling U.S. industry. Japanese capital flows into our relatively open markets while U.S. firms are blocked from entry into Japan by Japanese government policies and cultural impediments. Excessive restrictions from COCOM[15] have often stifled U.S. high tech exports resulting in lost market shares to other nations--sometimes even member nations. Its multi-national bureaucracy has been slow to respond to rapid technological advances worldwide thus resulting in the maintenance of ponderous, outdated export control lists. Internal debt has made a necessity of Japanese investment in the U.S. thus escalating our cost of capital to roughly twice that of Japanese companies. And finally, anti-industry rhetoric and actions by the U.S. government have undermined domestic industry weakening competitiveness and limiting future opportunities. The Japanese are aggressive at taking advantage of every opening.

But it would be naive to blame others, including the government, for the failures in industrial performance over the last decade.

---

[15] Coordinating Committee for multi-lateral export controls: Membership from NATO nations (excluding Iceland and Spain) plus Japan. Designed to insure that critical Western high technology is not exported to Communist Block.

Many U.S. industries have been slow to modernize (e.g. auto industry) and have misread investment opportunities and consumer needs. They have focused on the short-term and have not looked to the future, as have the Japanese. The stockholders' demand for large, quick profits often cost market shares and long-term interests. Many Japanese companies have operated in the red in order to secure market shares for the future. In some cases this action was supported indirectly by their government (e.g. low rates on capital, government subsidies, etc.). With increasing frequency, the "way out" for U.S. firms is to participate in joint ventures with the Japanese--if you can't beat them, join them.[16]

Some see these joint ventures as selling out, others say it's merely a result of the interdependency of the new world economic system. There is truth in both. What is disturbing is not the specifics of a given company's actions but the overall trend of increased Japanese investments...at a time when U.S. investments in Japan are minimal. With the flow of money comes increased influence or, said another way, diminished U.S. influence domestically and internationally.

---

[16] Note: AT&T and Mitsubishi recently signed a five year agreement to share Mitsubishi semiconductors and AT&T technology. Intel, Texas Instruments, U.S. auto manufacturers and others have "joined them."

V. THE STAKES

Throughout modern history technology has been the driving force behind economic dominance. High technology's growing importance in this century has been underscored by military considerations as exemplified in World War I and II. Nuclear weapons have made world war less likely due to the high probability of massive destruction. Deterrence has become the only rational military strategy and will remain so in the future. The nuclear umbrella has thus created an environment where most industrial nations can shift emphasis from military to economic competition. While the emphasis has changed, high technology remains central to both military and commercial considerations. "The national capacity to generate and use advanced technology is fundamental to the economic well-being and military security of the United States. The nation's innovative capacity is vital to military as well as economic security."[17] National interests--security, economic well-being, our values and our institutions--are tied directly to our competitiveness and, in key areas, to our leadership in high technology.

We are not the only nation that feels the need to compete in military and civilian high technology. "The leading industrial nations believe that their future economic growth depends on their

---

[17] International Competition in Advanced Technology: Decisions for America, Panel on Advanced Technology Competition and the Industrialized Allies, National Academy Press, Wash D.C., 1983, p.3

abilities to create advanced technologies and to sell the resultant products and processes in a global market."[18] In essence, all the leading powers are competing for the same market shares. There will be winners and losers. Conflicts will be inevitable. We have already lost significant commercial markets to competitors, especially the Japanese. Will we lose our military advantages also?

America's military withdrawal

The United States is drawing down its overseas and stateside military forces in response to fiscal constraints and perceptions plus some indications of a diminished Soviet threat globally. On February 23, Defense Secretary Richard Cheney announced a withdrawal of 12,000 troops from the Far East. U.S. basing rights are in jeopardy in the Philippines and elsewhere. Over the next decade it is likely that our presence in the Pacific and in Europe will be dramatically reduced. A more "European" NATO will probably fill the void in Europe. Who will fill the void in the Pacific?

Many Asian leaders fear that Japan will fill the void. Lee Kuan Yew, Prime Minister of Singapore, stated recently: "The most terrifying thought for me is a fundamental shift in the belief of the Japanese that the world that they have known since 1945 is at an end and that they have to either depend on themselves or come to

---

[18] ibid, p.14

some understanding with China or the Soviet Union."[19] Korea, the Soviet Union, China and other Asian nations remember the Japanese occupations...and the atrocities. In fact, Japan's Constitution states: "The Japanese people forever renounce war as a sovereign right of the nation and the threat or use of force as means of settling international disputes...Land, sea and air forces, as well as other war potential, will never be maintained."

This statement has not been followed by either Japan or the United States. We have looked for ways of expanding Japanese military strength in the region by calling the military forces "defensive" thus evading the intent of the Japanese Constitution. Congress now calls for more "burden-sharing" by allies, including Japan. While Japanese defense expenditures are approximately 1% GNP,[20] the pressures internally and externally mount for a higher number. With a GNP second only to the U.S., Japan has the third largest defense budget in the world.

This fact alone does not mean Japan will become a military threat to the region or to the U.S. or they will gain preeminence in military technology. However, recent events seem to indicate either possibility is conceivable. For example, the U.S. and Japan recently concluded the FSX contract that allows Japanese and

---

[19] Fallows, James. "The Bases Dilemma," Atlantic, February 1988

[20] Using NATO accounting methodology the number is closer to 1.8%.

American companies co-production of a highly modified F-16 fighter in Japan. This aircraft will not only give the Japanese a strong foothold in the fighter business but will also improve significant portions of their technology and industrial base for future commercial aviation endeavors.[21] If the U.S. elects to abandon its next generation air superiority fighter (Advanced Tactical Fighter) and only modifies existing fighter aircraft, we will have lost our leadership in this vital area to both the Japanese and Europeans.

Japanese independence

The Japanese, as noted earlier, wish to become independent actors. Their long-range goals tell them that to become independent they must be number one in the world in high technology, trade and finance. They talk little of military considerations but certainly understand the implications as the U.S. gradually pulls out of the Pacific. Japan knows it must fill the void to become militarily independent. Others' sensitivities will preclude them from aggressively pursuing military goals other than "defensive." But what systems are considered defensive today? Is a submarine offensive or defensive? A fighter? A tank? An anti-submarine warfare aircraft carrier?

---

[21] Some business experts predict that 30% of Boeing's next generation airliner will be built in Japan.

Finally, Japan is already leading in some key military technologies...or closing the gap rapidly (Figure 5). They have a significant role in our Strategic Defense Initiative (SDI) program and have been leaders for many years in optics and composite materials. How the Japanese choose to use these military-related technologies remains to be seen. Most likely, they will remain friendly to our interests but their future expanded military role, assuming it evolves, will be watched closely by all. Most likely, it will continue to grow as a significant dimension of their national power.

TECHNOLOGY COMPARISON
Japan vs. U.S.

BASIC TECHNOLOGY	U.S. LEAD	EQUAL	JAPAN LEAD
1 Aero/Fluid Dynamics	X		
2 Computer Software	X		
3 Computer Hardware		X	
4 Directed Energy (Laser)	X		
5 Optical/Radar Electronics		X	
6 Guidance & Navigation	X		
7 Life Science	X		
8 Materials		X	
9 Micro-Electronics Matl's			X
10 Optics			X
11 Production/Manufacturing			X
12 Propulsion	X		
13 Robotics		X	
14 Signal Processing		X	
15 Stealth	X		
16 Telecomm/Fiber Optics		X	

Source: Aviation Week & Space Technology/12Feb90

Figure 5

VI. CONCLUSIONS

The revolution in high technology is having a profound impact on the world and will continue to do so in the future...at ever accelerating rates. For many years a critical factor in shaping the military balance of power, high technology now has become the dominant factor in the economic environment as well.

Intercontinental boundaries have been eliminated by extraordinary advances in telecommunications and aerospace resulting in a 24 hour flow of capital and trade throughout world markets. These dramatic changes are only a prelude to the revolutionary changes in the next decade and beyond. World leadership will go to the nation that dominates international high technology competition.

Japan and the United States are currently locked in battle for superiority in world economic markets, with Japan on the rise and the U.S. on the decline. The implications for each country and for the world in general are significant. Japan may soon become the controller of the international financial system...the yen the currency of choice. The United States will continue to be the dominant military power into the 21st century but may decline, as did Great Britain in the first half of this century, as the dominant economic power. As Japanese capital grows so will its influence...economically and militarily. Encouraged or coerced by increasing Congressional pressure for more "burden sharing," a resurgent Japanese military could fill the Pacific vacuum created by the slow, inexorable withdrawal of U.S. forces. This could portend troubled times for Americans and Asians.

Many questions remain to be answered if the U.S. is to compete successfully with Japan, especially in the critical high technologies. Will escalating public outrage against Japan be redirected towards useful causes (e.g. education, anti-drug

programs, etc.) or will it be wasted on political rhetoric? Will American industry begin thinking long-term, possibly forsaking short-term profits? Will the government actively support American business through cooperative endeavors? How will Japan respond to bold American efforts to reverse competitive trends? Has too much capital flowed to Japan already making any attempts to change these trends futile? Will the Congress and the President have the leadership qualities to conquer the national debt...quickly? These and other questions must be debated and answered soon; time is short.

However, not all is doom and gloom; the potential for progress exists. Recent meetings of COCOM have led to updated, less restrictive export control lists. Senator John Glenn (D-Ohio) has proposed a bill that would convert the Department of Commerce into the Department of Industry and Technology with an Advanced Civilian Technology Agency. A similar agency was recommended by the Office of Technology Assessment. The Congress and the Bush Administration are pushing the Japanese to make "real" changes to their markets as opposed to superficial changes recommended in the past. The threat of protectionist legislation adds weight to their arguments. Finally, and most notably, House Ways and Means Chairman Dan Rostenkowski (D-Il) had the "guts to tell the whole truth"[22] about our disastrous fiscal policies. His bold corrective action calls

---

[22] Rowen, Hobart. "The Whole Truth From Rostenkowski," The Washington Post, Mar. 15, 1990, p. A-27.

for sharing the pain of increased taxes, decreased defense spending, Social Security cost-of-living freezes, etc.

The American people and their leadership have always responded to crisis if the crisis was known. We have begun to make progress in "knowing" this crisis. The daily press is now giving extensive coverage to Japan-U.S. issues including high tech economic competition.

On February 24th, the governors of all the states set National Education Goals which are to be achieved by the year 2000. The goals are: a number one ranking of American high school students compared to similar students from the industrial nations; a high school graduation rate of 90%; and an important role for industry and high technology in the process.

Recent innovations in semiconductor technology by U.S. companies have the potential to put them in market leadership positions. A consortium has been formed in the research phase of the National Aerospace Plane program that should insure broad, active aerospace research and development by industry as budgets shrink. There seems to be growing support for NASA and its high technology programs including the space station and Mars trip. However, the overall trends are still downward--and the stakes significant.

The new competitive environment will be dominated by rapid changes,

bold innovations, and high technical and financial risks. Companies wishing to compete will play by these rules. One thing is certain: sporadic examples of progress will not stop our downward trend. Action across a broad front is necessary...just like the Japanese are doing!

VII. RECOMMENDATIONS

First, we have to know the character and size of the threat and its impact on our vital interests. The military threat is "understandable" to most but the new economic threat is couched in language that we fail to understand or have no direct interest in. Leaders must speak openly of the dangers. Complex issues must be boiled down to simple, sound, and repeatable arguments. If the urgency is noted, the arguments simple, and the "right" people are carrying the word, the populace will respond.

The U.S. government must set policies that create a favorable environment for industry.

-Eliminate the national debt...a terrible burden for American business! The need for foreign financing to service the debt has raised domestic interest rates to a point where it now costs U.S. business roughly twice as much to borrow capital as it does Japanese business.

-Reduce the cost of capital. Incentives for creating a higher savings rate must be put in place so domestic interest rates come

down.

-Develop a positive government/business relationship. Tax laws, COCOM rulings, public pronouncements, and constructive incentives must be designed to enhance business interests. The government should encourage and invest in promising "emerging" civil technologies while continuing military research and development. Active participation by the government to foster American business must be accomplished for the sole purpose of gaining market shares...that is, winning.

-Counter unfair foreign trading practices quickly. Unfair foreign practices must be identified and countered immediately instead of bargaining year after year while losing market shares.

-Develop efficient methods for internal technology transfer. Military and civil experts must find innovative ways of transferring advanced technology between the military and civilian sectors...without compromising national security.

National priorities must be viewed and debated in the context of both the short-term and the long-term.

-Form a government inter-agency and business/science team to discuss the efficacy of having a comprehensive national economic strategy to deal directly with U.S. competitiveness. It would discuss secondary issues such as: 1.) Level and balance of Federal spending on civilian and military R&D, and 2.) Use of national intelligence assets and information to influence the national economic strategy.

-Give special attention to the status and future of the defense industrial base--a national asset. Military officers should engage with industry and civilian leadership in debating and defining the look of our future industrial base since decisions being made now on major weapons systems will shape the industrial base well into the next century. These important decisions will also determine whether or not American industry remains preeminent in many critical high tech areas.

Most importantly, our leaders must lead. Each has an inherent responsibility to present the facts, the options, and selfless recommendations in the nation's best interests. Long term interests must take precedence over short term expediencies. Key members of the Congress and Executive Branch must tell America the "hard" truth. Rhetoric for self-interests must cease; urgent action is needed now. Americans will respond--even to difficult choices. We must win this competition!

BIBLIOGRAPHY

Arndt, Sven W. and Bouton, Lawernce. Competitiveness-The United States in World Trade , American Enterprise Institute for Public Policy Research, Washington, DC, 1987.

Beauchamp, Marc. "We Need to be First," Forbes, Feb. 5, 1990, pp. 112-116.

Brandin, David H. and Harrison, Michael A. The Technology War, John Wiley & Sons, New York, 1987.

Burnstein, Daniel. YEN!, Fawcett Columbine (Ballantine Books), New York, 1990.

Cohen, S.D. Uneasy Partnership, Ballinger Publishing Company, Cambridge, Ma., 1985.

"A Corporate Lag in Research Funds," New York Times, Jan 23, 1990, p. A-1.

"Doing Business in and with Japan," American Management Association, 1969.

"Economic History Since 1500," Encyclopedia Britannica, H.H. Benton Publisher, 1983, Vol. 6, pp. 219-255.

Ferguson, Charles H. "America's High-Tech Decline," Foreign Policy, Spring 1990, p. 133.

Forester, T. ed. The Materials Revolution, MIT Press, Cambridge, Ma., 1988.

"The Future of Silicon Valley," Business Week, Feb. 5, 1990, pp. 54-59.

Greenberg, D. "The Plight of American Technology," The Baltimore Sun, Mar. 7, 1990, p. 15.

Hiatt, Fred and Shapiro, Margaret. "U.S.-Japan Ties Seen at Lowest Point Since War," The Washington Post, Feb.12, 1990, p. A-1.

Irwin, Manley. Competitive Freedom Versus National Security Regulation, Quorum Books, New York, 1989.

Islam, Shafiqul. "Capitalism in Conflict," Foreign Affairs, Vol. 69, No. 1, 1990, p. 180,182.

Ito, Kan. "Trans-Pacific Anger," Foreign Policy, Spring 1990, Number 78, pp. 131-152.

Keller, J.T. "AT&T Joins Forces with Mitsubishi Electric on Chips," The Wall Street Journal, Feb. 16, 1990, p. B-8.

Margiotta, Franklin and Sanders, R. ed. Technology, Strategy and National Security, National Defense University Press, Washington, DC, 1985.

Morita, Akio and Ishihara, Shintaro. The Japan that Can Say "No", Kobunsha Kappa-Holmes, Tokyo, Ja., 1988.

Rowen, Hobart. "The Whole Truth From Rostenkowski," The Washington Post, Mar. 15, 1990, p. A-27.

Shinokai, N.B. Japan as an Export Market, Jetro Marketing Series, Tokyo, Ja., 1972.

Silverberg, David. "Export Control Policies Uncertain as Changes Sweep Europe," Defense News, Mar. 5, 1990, p. 12.

Smith, Lee. "Fear and Loathing of Japan," Fortune, Feb. 26, 1990, pp. 50-60.

Spencer, Edson W. "Japan as Competitor," Foreign Policy, Spring 1990, Number 78, pp. 153-171.

Sugawara, S. and Sawyer, K. "Space Consortium Announced," The Washington Post, Jan. 24, 1990, p. D-1.

Szyliowicz, J.S. Technology and International Affairs, Praeger Publishers, New York, 1981.

"Trade Negotiations Hint at Sanctions," The Washington Times, Mar. 6, 1990, p. C-1.

Traditional Competition in Advanced Technology: Decisions for America, National Research Council, Panel on Advanced Technology Competition and the Industrialized Allies, National Academy Press, Washington, DC, 1983.

United States-Japan Trade Report, U.S. House of Representatives, Subcommittee on Trade, U.S. Government Printing Office, Sep. 5, 1980.